MODIS Technical Team Meeting
Thursday, May 22, 2003
Building 33, Room E108

Vince Salomonson chaired the meeting. In attendance were Chris Justice, Ed Masuoka, Eric Vermote, Shaida Johnston, Robert Wolfe, Wayne Esaias, Jack Xiong, Greg Leptoukh, Bruce Guenther, Bill Barnes, Bob Barnes, Dorothy Hall, and Barbara Conboy, with David Herring taking the minutes.

1.0 Upcoming events

MODLand Workshop, July 15-16 (tentative), location not yet set.
IGARSS 2003, July 21-25, 2003, Toulouse, France (abstracts deadline past).
http://www.igarss03.com/
10th International Symposium on Remote Sensing by The International Society for Optical Engineering (SPIE). September 8-12, 2003, Barcelona, Spain (abstracts deadline past). http://www.spie.org/info/rs

2.0 Meeting Minutes

2.1 General Discussion
Esaias said users are beginning to notice and appreciate the timely availability of MODIS data (now usually available within 3 to 4 days). Wolfe suggested that we could use this type of user feedback to make the case for improving the timeliness of data delivery from EDOS and EMOS. Johnston raised the question, which way do we want to go on that with respect to managing the production system? Do we keep the production as close as possible to the leading edge while producing good science products? Or do we manage expectations a bit and not worry about how close we are to the leading edge? Wolfe suggested the former, though Justice cautioned that MODIS was not designed to be an operational system.

According to Johnston, the Aqua MODIS data reprocessing is next on the schedule, assuming the various disciplines are ready with their changes. The Land Group is planning to discuss the changes needed for Aqua reprocessing at a MODIS Land meeting in July 15-16, 2003. Most of changes to the Level 1b code have already been made. She said we can start the reprocessing on Nov. 1, 2003, at the soonest, but it depends on whether the discipline groups are ready with their changes.

Esaias stated that, for Oceans, if SeaWiFS fails then that near-real-time capability has to be replaced. Salomonson noted the existence of a new Web site, hosted at the University of South Florida, called "Save SeaWiFS." Visitors can vote there and/or voice their opinions on whether they feel the SeaWiFS mission should be continued beyond December 2003. (The current plans are to discontinue the mission at the end of this year.)

Conboy announced that the next MODIS Science Team meeting is currently being planned for Sept. 30 – Oct. 2, 2003.

2.2 Instrument Status

Xiong reported that the Terra Deep Space Calibration Maneuver was successful and good data were retrieved with respect to the response versus scan angle (RVS) issue. So MCST now plans to analyze some data granules to determine when the best time is for doing their tests. SeaWiFS also performed its lunar calibration maneuver, so MCST and SeaWiFS can use irradiance from the Moon for comparison. Xiong said MCST has finished its preliminary analysis of these data. He plans to publish the data when they are ready. He has not yet completed the full suite of "angle of incidence" (AOI) tests, but he has been looking at brightness temperature versus AOI.

Salomonson asked if these calibration data are being used by the Ocean Group at Miami to improve the quality of the sea surface temperature product. Esaias said Peter Minnett would be at Goddard next week to discuss that topic (most of the analysis capability at Miami is being devoted to refining the radcor files right now).

2.2.1 Aqua MODIS
Regarding Aqua MODIS, Barnes said that once, for five days, we had both the solar diffuser door and screen door open inadvertently and we didn't know about it. That was when went Aqua MODIS went into "safe hold" mode. The questions are did Aqua MODIS also see some thermal excursions that would be insightful with regard to the solar diffuser door anomaly on Terra? He pointed out that when the screen is open it is black on one side and the Sun shines on that surface.

Another thing to consider, Barnes stated, is if this screen door problem is due to a design failure and the screen door is prone to failure after a certain amount of time, then we will have to consider that fact in our plans for Aqua MODIS down the road.

2.2.2 Terra MODIS
Barnes announced that the solar diffuser screen on Terra MODIS is now stuck in the closed position. He said the screen did not open after the last calibration maneuver, which is bad. Barnes elaborated that MODIS did about 30 calibrations in a row some time ago to look at noise in its data and SBRS is wondering if the screen got hot and perhaps this heating caused the screen, or something else, to expand a bit and result in the jam in the shut position. Since the screen won't open, this means the sensor currently works well for the Ocean bands, but not so well for the Land and Atmosphere bands. In speaking to SBRS, Barnes said Roger Drake wants to do a thermal analysis to test its theory. Salomonson has approved the thermal analysis, which Barnes says will take two weeks to do.

Barnes continued by saying that current thinking is if we can get the SD door open one more time, then we'll leave it open and never close again for the remainder of the mission. That will be the sensor's "safe mode." Meanwhile, Xiong proposed an idea for how to deal with this problem in the event the screen cannot be opened again. Xiong noted that some bands give beneficial inputs with the screen up and other bands (e.g., the oceans bands) with it down. Perhaps MCST can take some of those bands and derive the ratio of inputs from "screen up" and "screen down" periods. If that ratio is uniform, then MCST can apply the ratio as a data correction to those bands for Land and Atmosphere products.

Guenther asked if there are redundant windings on the motor? Barnes responded the motor is fine and there is a mechanism for unhooking the motor. This is the "Fail safe" mode. But if anything is in the axis and there's a jam, turning the motor loose may not solve the problem—which is why opening the SD door with screen in place and not closing the SD door anymore appears to be the best solution.

2.3 DAAC

Leptoukh reported that operations at the GES DAAC were quite nominal for the last week. Aqua and Terra data are being processed at the leading edge. He said Collection 4 processing looks okay - the DAAC has processed about 75 percent of the data for Land and Atmosphere. System downtime was planned for 4-6 hours, DAAC availability was 80 percent, and about 3.2 TB of data were pushed to users. The rate of order failure was around 5 percent. Leptoukh said it appears that the amount of data being served to the public is going up, but he doesn't know exactly by how much. Distribution from the data pool is going up and there are more users using the data pool even as the GES DAAC has also been improving system performance.

Leptoukh said the DAAC provided inputs into to the Ocean Group's sampling test. These were global samples done over time.

2.4 MODAPS

Masuoka said that MODAPS will be idle after the Aqua reprocessing, since PGEs for before the processing of Collection 5 for Terra and Aqua won't be ready until the fall of 2004. The intent is to reprocess both data sets together, starting first with Terra, and then, for a time period after Aqua launch, conduct a combined reprocessing. It will be important to have time to make significant changes for this major reprocessing of both Terra and Aqua, a.k.a Collection 5. Masuoka pointed out that since the 2.5years of Terra MODIS data acquired before Aqua MODIS "first light" would be processed first, there should be sufficient time to make the changes needed for Aqua even if all weren't ready at the start of the Collection 5 reprocessing. He said that at current required reprocessing rate of 4X (2X per instrument) a Fall start will allow 1 full reprocessing of the MODIS products from Terra and Aqua to be completed and possibly a second one started before the funding for the Science Team runs out at the end of FY06. Masuoka is looking into ways to increase the reprocessing rate in MODAPS including: generating Level 1B for all disciplines from Level 1A stored in a MODAPS archive, reducing product volumes to facilitate ingest into the DAACs or keeping product volumes at current size but storing them in MODAPS archives and sending them to the DAACs when the system is not doing a reprocessing. Masuoka noted that getting ready for each reprocessing takes on the order of 9-10 months, of which roughly 6 months are spent determining what changes are desired in the PGEs for the next collection and implementing them; and 3-4 months are spent in integration and science testing to get the new PGEs into production.

Wolfe reported that there was an Earth science modeling framework workshop last week. He said framework-modeling developments are underway to allow the interplay of different models as well as to assimilate remote-sensing data like MODIS. Wolfe said he obtained some valuable information to help the team integrate MODIS data into that community.

In terms of Land and Atmosphere product reprocessing, Masuoka said MODAPS production is waiting on new Level 3 Atmosphere PGE code to pass integration and testing. King said there's a toolkit issue that his group is working on, but the code has been delivered.

Production encountered a problem at the EDCDAAC, which was traced back to the install of ECS 6A.07. The problem caused archiving at the DAAC when there was a hardware failure on one of the computing systems that provide data to a StorageTek silo. The combination of hardware and software problems resulted in 11,000 granules being lost at the DAAC before being written to the archive. The problem with the software was made worse by a hardware problem in one of the systems, which can be recovered later. MODAPS is resending the lost granules but by now some of the data is no longer in MODAPS and would have to be remade.

Salomonson mentioned that Raytheon had won the EOSDIS Maintenance and Development (EMD contract. Justice asked if there was an opportunity for the team to develop a wish list of items MODIS wanted the contractor to implement. Salomonson asked the PIP to develop a list of enhancements MODIS could forward to the ESDIS Project for potential implementation under the new contract.

Esaias has mentioned that the Ocean products from the Near Realtime Processing System (NRTPS) for MODIS run by NOAA and posted on NOAA Coast Watch showed striping and other artifacts. If they don't catch and correct these types of problems then the science community will see these artifacts and this will reflect badly on MODIS. Masuoka will confirm what the NRTPS uses for their Level 1 production. [Note Masuoka checked and the NRTPS has the latest version of the Oceans PGEs 9 and 10 but is having difficulty getting them running. The Level 1 PGEs are out of date and NRTPS was going to get those from the GES DAAC. Agreement at the 6/3 PIP meeting was that SDST will deliver PGE 01, 02 and 03 to NRTPS instead of the DAAC. Also, Masuoka wondered if NOAA should do quality assurance on the data they process or if MODIS should do some cursory examination of Web sites where these data are posted to see if problems are cropping up in terms of data quality.

Salomonson asked to invite either Gene Legg or Bruce Ramsay from NOAA to come and show the quality of the images they are producing. Esaias noted that that QA is in the agreement with NASA and NOAA is supposed to do that. Justice added that another issue is a statement or documentation as to whose product is being produced.

The Team also discussed the issue of timely releases of software updates for the production of MODIS Direct Broadcast data. Salomonson asked Masuoka to work with Pat Coronado on that. Esaias said that at the recent University of New Hampshire workshop, users were pleading with us to release the code as soon as any new updates are developed, without delay. Masuoka noted that Pat Coronado had received deliveries of many of the recent PGEs (the latest version of 36 of the PGEs have been delivered) but these were not appearing on Coronado's site.

Masuoka said Dan Marinelli had contacted EOSDIS regarding MODIS plans to make 40GB/day of snow and sea ice products for the NSIDC archive. Currently MODIS sends 12GB/day to the archive and if there is no plan to reach 40GB soon the ESDIS Project

could reduce the size of the network to NSIDC and save money. Wolfe pointed out that some of the remaining allocation was for the polar snow products and the sea-ice products in the equatorial grid. Wolfe will work with Hall to determine the schedule for bringing these products on-line.

Regarding the Ocean Group's delivery of radcor files, Masuoka has some concerns about whether the 5/30 delivery date will be met given Miami concerns regarding calibration of bands 15 and 16. He noted that it is critical to resolve this issue quickly if we are to complete ocean reprocessing by 10/30/03.

2.5 Oceans Discipline
Esaias is working with Chuck McClain and Watson Gregg to plan Climate Data Records (CDRs) for Ocean products, and to determine what they need to be.

He announced that Geotimes and Discover are both planning to do stories on the global Net Primary Productivity product.

Esaias reported Chris Jackson found that MODIS data in sun-glint are great for looking at internal waves.

Regarding the radcor file, the Ocean Group is making progress; the present radcor files look better than ever. There are three points of concern: (1) there appears to be a trend of about 2% over life of Terra that seems to correlate with a trend in bands 15 and 16; (2) many of the effects we see in Terra MODIS data over Southern Ocean anomaly and the loss of radiance in June, depending upon which aerosol model they choose, don't seem to be present in Aqua MODIS data. So it looks like the Aqua sensor gets it right, but there is still uncertainty for Terra and the Group is trying to figure out why.

Esaias said the radcor due date is next Friday. The Ocean Group at Miami is doing push-ups to understand what's going on. Esaias is optimistic that, now that the group has found the "smoking gun," the problem appears to be reproducible and he hopes Miami can fix the bug once and for all.

2.6 Land
Justice said he is hoping for a MODLand workshop on July 15-16 to try and put some energy into the lame duck team. For instance, there needs to be some validation work done.

Salomonson said that when team gets reconstituted, here are the priorities he has proposed:
> Update ATBDs and users guide,
> Simplify the ability for users to acquire products including working with the EOSDIS, ESIPS, etc.,
> Work with the modeling community to help them improve and increase the assimilation of MODIS data, and
> Produce climate research quality data sets.

Justice reported that Marshall Shepherd is organizing a fire-product press release at NASA HQ.

2.7 Cryosphere

Hall reported that George Riggs is looking at the Aqua snow products produced after the latest new revised cloud mask. He found that the Level 2 product looked fine, but the Level 3 fractional snow product won't be released until Hall's group has had a chance to review it further.

3.0 Action Items

3.1 New Action Items

3.1.1 PIP to develop list of items to go into work plan for the new contract (EMD).

3.1.2 Ed Masuoka to invite a NOAA delegate to the weekly MODIS Tech Team meetings or the PIP meetings.

3.2 Old Action Items

3.2.1 King and Kempler to work together on getting ESDTs for the new Atmospheres L2 data product.
Status: Open.

3.2.2 Kempler to coordinate with Oceans group on creating documentation for the DAAC on the new Oceans L1A data subsets.
Status: Open.

3.2.3 Tech Team to further discuss TRW using MODIS data for validation of the NPP/NPOESS production process.
Status: Open.